IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl.No.:   09/659,431
Applicant: Hosur et al
Filed: September 8, 2000
TC/AU: 2634
Examiner: Liu

Docket: TI-29648
Cust.No.:   23494

Confirmation No.: 4265

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APPELLANTS' BRIEF (in triplicate)

Commissioner for Patents
P.O.Box 1450
Alexandria VA 22313-1450

Sir:

The attached sheets contain the Rule 41.37 items of appellants' brief. The Commissioner is hereby authorized to charge the fee for filing a brief in support of the appeal plus any other necessary fees to the deposit account of Texas Instruments Incorporated, account No. 20-0668. A fee transmittal sheet is enclosed.

Respectfully submitted,

Carlton H. Hoel
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Rule 41.37(c)(1)(i) Real party of interest

Texas Instruments Incorporated owns the application.

Rule 41.37(c)(1)(ii) Related appeals and interferences

There are no related dispositive appeals or interferences.

Rule 41.37(c)(1)(iii) Status of claims

Claims 1-9 are pending in the application with claims 4-9 allowed and claims 1-3 finally rejected. This appeal involves the finally rejected claims.

Rule 41.37(c)(1)(iv) Status of amendments

There is no amendment after final rejection.

Rule 41.37(c)(1)(v) Summary of claimed subject matter

The invention provides a method, useful in spread spectrum wireless communication (e.g., CDMA), of combining detected multipath signals using weightings derived from the eigenvalues of the covariance matrix of the detected multipaths. Application page 8, bottom 11 lines plus page 9, top 7 lines list the method steps with y(k) denoting the vector of detected multipath signals for time interval k. The combining is the sum on page 9, line 3 where w_A is the eigenvector corresponding to the largest eigenvalue of the covariance matrix.

Rule 41.37(c)(1)(vi) Grounds of rejection to be reviewed on appeal

The grounds of rejection to be reviewed on appeal are:

(1) whether claim 1 is anticipated by the Golden reference.

(2) whether claims 1-2 are anticipated by the Golden reference.

(3) whether claims 1-2 are anticipated by the Brunner reference.

(4) whether claims 1-3 satisfy the written described requirement.

Rule 41.37(c)(1)(vii) Arguments

(1) Claim 1 was rejected as anticipated by Golden; the Examiner cited Golden Figs.1-3 and covariances R_{xx} and R_{i+n}.

Appellants reply that claim 1 requires a single antenna receive multipath inputs which lead to the covariance matrix. In contrast, Golden Figs.1-3 is a multiple antenna approach where the cited R_{xx} and R_{i+n} are (cross)correlations among the antennas; see column 1, lines 32-66. In fact, Golden column 4, lines 49-52 is explicit: "As illustrated in FIG.1, the communication system and method of the invention relates to an antenna array illustratively consisting of a plurality of generally matched antenna elements, 20_1 through 20_M." Consequently, Golden Figs.1-3 do not suggest claim 1.

(2) Claims 1-2 were rejected as anticipated by Golden; the Examiner cited Golden Figs.3-4 and primarily column 6.

Appellants repeat argument (1): independent claim 1 requires a single antenna receive the multipath inputs; whereas, Golden is a multiple antenna system. Indeed, cited Fig.3 shows 4 antennas, and cited column 6, lines 23-29 describes the 4 antenna system. Again, Golden does not suggest the claims.

(3) Claims 1-2 were rejected as anticipated by Brunner; the Examiner cited Brunner Fig.2 and the covariance matrix, R_{SIN}, of equation (4) and the left column of page 2384.

Appellants again reply that independent claim 1 requires a single antenna receive the multipath inputs; whereas, Brunner is a multiple antenna approach. Indeed, the cited Fig.2 left-hand portions shows M antennas, and the cited page 2384, left column has "...Then the (over)sampled output of each antenna element is passed through a correlator ... cf. Figure 2." Further, the cited covariance matrix, R_{SIN}, is defined by vector $y_p^{(1)}$ which, in turn, is defined in terms of $\chi_p J^{(i)}$ where $J^{(i)}$ is a selection matrix (windowing) and χ_p is matrix of correlator outputs for all M antennas. Hence, Brunner does not suggest the claims.

(4) Claims 1-3 were rejected as failing to comply with the written description requirement; the Examiner cited page 5, lines 10-11 as precluding the case of a single antenna as claimed.

Appellants reply that the cited page 5, lines 10-11 do not preclude a single antenna per receiver; the cited "antennas may be parts of receivers" does not specify the number of antennas per receiver. Furthermore, in the paragraph bridging pages 5-6 the received baseband signal, r(t), is a scalar which implies a single antenna, as does the corresponding Figure 1a with tracker-correlators which would apply to a scalar baseband input.

Rule 41.37(c)(1)(viii) Claims appendix

1. A method of multipath combining, comprising:

    (a) forming at least one matrix of covariances of multipath inputs from a single receiver antenna;

    (b) finding an eigenvector of said matrix; and

    (c) combining said multipath inputs relatively weighted according to the components of said eigenvector.

2. The method of claim 1, wherein:

    (a) said eigenvector is associated with a maximal eigenvalue of said matrix.

3. The method of claim 1, wherein:

    (a) said weightings have magnitudes proportional to the squared magnitudes of said eigenvector components and have phases proportional to the phases of said eigenvector phases.

Rule 41.37(c)(1)(ix) Evidence appendix

Rule 41.37(c)(1)(x) Related proceedings appendix

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Srinath Hosur et al.
Serial No: 09/659,431
Filed: 9/8/2000
Art Unit: 2634
Examiner: S. Liu
Docket No.:   TI-29648
Conf. No.:   4265
Customer No.: 23494

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following papers are being transmitted by
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FACSIMILE COVER SHEET

_X_ FACSIMILE COVER SHEET (1 SHEET)	___	AMENDMENT _____
___ NEW APPLICATION	___	EOT _____
___ DECLARATION	___	NOTICE OF APPEAL _____
___ ASSIGNMENT	_X_	APPEAL _____ BRIEF (5 Pages)
___ FORMAL DRAWINGS	___	ISSUE FEE
___ INFORMAL DRAWINGS	___	REPLY BRIEF (IN TRIPLICATE)
___ CONTINUATION APP'N	_X_	Fee Transmittal
___ DIVISIONAL APP'N		

NAME OF INVENTOR(S):	RECEIPT DATE & SERIAL NO.:
Srinath Hosur et al.	**Serial No.: 09/659,431**
TITLE OF INVENTION:	**Filing Date: 9/8/2000**
Spread Spectrum Multipath Combination	**Conf. No.: 4265**

TI FILE NO.:	DEPOSIT ACCT. NO.:
TI-29648	**20-0668**

FAXED: 09/16/2004
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PTO/SB/17 (10-03)
Approved for use through 07/31/2006. OMB 0851-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL
For FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	$330

Complete If Known

Application Number	09/659,431
Filing Date	9/8/2000
First Named Inventor	Srinath Hosur
Examiner Name	S. Liu
Art Unit	2634
Attorney Docket No.	TI-29648

METHOD OF PAYMENT (Check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ Credit Card

☒ Deposit Account

Deposit Account Number: **20-0668**

Deposit Account Name: **Texas Instruments Incorporated**

The Director is authorized to: *(check all that apply)*

☒ Charge fee(s) indicated below   ☐ Credit any overpayments
☐ Charge any additional fee(s) during the pendency of this application
☐ Charge fee(s) indicated below, except for the filing fee
to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

		Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =	0	X	$18	= 0
Independent Claims		-3** =	0	X	$86	= 0
Multiple Dependent						=

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	
1202	18	2202	9	Claims in excess of 20	
1201	86	2201	43	Independent claims in excess of 3	
1203	290	2203	145	Multiple dependent claim, if not paid	
1204	86	2204	43	**Reissue independent claims over original patent	
1205	18	2205	9	**Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) $0

**or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	Fees Paid
1051	130	2051	65	Surcharge – late filing fee or oath	
1052	50	2052	25	Surcharge – late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	205	Extension for reply within second month	
1253	950	2253	485	Extension for reply within third month	
1254	1,480	2254	725	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	160	Notice of Appeal	
1402	330	2402	160	Filing a brief in support of an appeal	$330.00
1403	290	2403	140	Request for Oral Hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive – unavoidable	
1453	1,330	2453	650	Petition to revive – unintentional	
1501	1,330	2501	650	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	315	Plant issue Fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	375	Filing a submission after final rejection (37 CFR 1.129(b))	
1810	770	2810	375	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	375	Request for Continuation Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) $330.00

SUBMITTED BY

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Signature				Date	9/16/2004

(Complete (if applicable))

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